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Date: **June 19, 2012**

To: **Amy Wolff, Durham City County Planning Department**
From: **Bill Judge PE, City of Durham Department of Transportation**
Subject: **Southpointe Apartments (Z1100028) Traffic Impact Analysis**

The Unified Development Ordinance (UDO) requires that a Traffic Impact Analysis (TIA) be prepared for proposed developments estimated to generate 150 or more peak-hour vehicle trips. The proposed development, Southpointe Apartments, is a 340 unit apartment complex that is expected to generate 2,184 daily trips with 170 a.m. peak-hour trips (34 entering and 136 exiting) and 205 p.m. peak-hour trips (133 entering and 72 exiting). The proposed development is located on the east side of NC 55 south of Riddle Road. The expected completion year is 2012, and the TIA analysis year is 2013. The Southpointe Apartments TIA was prepared by Wilbur Smith Associates in October 2011.

TIA Addendums in March 2012 and April 2012 subsequently reduced the project density to 179 apartment units. The revised development plan for 179 apartment units is expected to generate 1,208 daily trips with 91 a.m. peak-hour trips (18 entering and 73 exiting) and 116 p.m. peak-hour trips (75 entering and 41 exiting). Although a TIA is no longer required since the revised development plan generates less than 150 peak-hour trips, the TIA results are provided below for informational purposes.

Study Area
The study area includes the following intersections:

- NC 55 and Riddle Road;
- NC 55 and Cornwallis Road;
- NC 55 and Site Access #1; and
- NC 55 and Site Access #2.

Trip Generation
Trip generation numbers are based on the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 8th *Edition*, 2008. By utilizing Land Use Code 220 (apartments), the site is expected to generate 1,208 daily trips with 91 a.m. peak-hour trips (18 entering and 73 exiting) and 116 p.m. peak-hour trips (75 entering and 41 exiting).

Traffic Data Collection
The peak-hour intersection turning movement counts were taken from 7-9 a.m. and 4-6 p.m. in October 2011.

Trip Distribution and Assignment
The assignment of site traffic on the study area roadway network was based on the following trip distribution percentages:

- To/From the North via NC 55: 45% of site trips;
- To/From the East via Riddle Road: 10% of site trips;
- To/From the West via Riddle Road: 5% of site trips;
- To/From the South via NC 55: 25% of site trips;
- To/From the East via Cornwallis Road: 10% of site trips; and
- To/From the West via Cornwallis Road: 5% of site trips.

Approved Developments and Background Growth
There are no approved projects in the vicinity. A uniform annual compounded growth rate of 3% was utilized to determine the background traffic projections.

TIP Roadway Improvements
There are no significant scheduled transportation improvement projects in the study area vicinity.

Capacity Analysis
Capacity analyses were performed using the a.m. and p.m. peak-hour for the following scenarios:

- Existing (2011) conditions;
- No-Build (2013) conditions (2011 Existing + Background growth traffic); and
- Build (2013) conditions (2011 Existing + Background growth traffic + Site traffic).

This development and project study area are located within the Suburban Tier where the adopted LOS standard is LOS D. The following table summarizes the average delay for the various Levels of Service (LOS) for unsignalized and signalized intersections:

	Signalized Intersections	Unsignalized Intersections
Level of Service	**Average Vehicle Delay (Seconds)**	**Average Vehicle Delay (Seconds)**
A	**0-10**	**0-10**
B	**10-20**	**10-15**
C	**20-35**	**15-25**
D	**35-55**	**25-35**
E	**55-80**	**35-50**
F	**>80**	**>50**

NC 55 and Riddle Road

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2011)	**C**	**C**
No-Build (2013)	**C**	**C**
Build (2013)	**C**	**D**

The intersection currently operates at a LOS C during both the a.m. and p.m. peak-hour. With the additional site traffic, the delays will increase slightly, but the intersection will remain at an acceptable LOS D or better for both peak hours. No roadway improvements are required to address the site traffic impacts.

NC 55 and Cornwallis Road

The following table summarizes the Levels of Service at this existing signalized intersection:

Scenario	a.m. LOS	p.m. LOS
Existing (2011)	**E**	**D**
No-Build (2013)	**F**	**D**
Build (2013)	**D**	**D**

The intersection currently operates at a LOS E during the a.m. peak-hour and a LOS D during the p.m. peak-hour. With the projected background growth, the intersection will decrease to a LOS F in the a.m. peak-hour for the No-Build (2013) condition. To improve the LOS at this intersection, the TIA recommended the following improvement:

- Revise the signal timing to optimize the efficiency of all movements.

With the proposed improvement, the intersection is expected to operate at an acceptable LOS D in both the a.m. and p.m. peak-hour for the Build (2013) condition.

NC 55 and Site Driveway 1

The following table summarizes the Levels of Service at this proposed unsignalized intersection:

Scenario	a.m. LOS	p.m. LOS
Build (2013)	**C***	**C***

* Unsignalized operation, with LOS reported for the worst (WB) approach

The westbound approach on Site Driveway 1 would operate at an acceptable LOS C during both the a.m. and p.m. peak-hour with site traffic and the following recommended improvement:

- Construct Site Driveway 1 with one ingress lane and two egress lanes with an appropriate internal tangent throat distance; and
- Construct a northbound right-turn lane on NC 55 at Site Drive 1 with a minimum of 100 feet of storage and appropriate tapers.

NC 55 and Site Driveway 2 (Right-In/Right-Out)

The following table summarizes the Levels of Service at this proposed unsignalized intersection:

Scenario	a.m. LOS	p.m. LOS
Build (2013)	**A***	**A***

* Unsignalized operation, with LOS reported for the worst (WB) approach

The westbound approach on Site Driveway 2 would operate at an acceptable LOS A during both the a.m. and p.m. peak-hour with site traffic and the following recommended improvement:

- Construct Site Driveway 2 as a right-in/right-out access with one ingress lane and one egress lane with an appropriate internal tangent throat distance; and
- Construct a northbound right-turn lane on NC 55 at Site Drive 2 with a minimum of 50 feet of storage and appropriate tapers.

Summary of Required Improvements:

NC 55 and Site Driveway 1

1. Construct Site Driveway 1 with one ingress lane and two egress lanes with an appropriate internal tangent throat distance.
2. Construct a northbound right-turn lane on NC 55 at Site Drive 1 with adequate storage and appropriate tapers.

NC 55 and Site Driveway 2 (Right-In/Right-Out)

1. Construct Site Driveway 2 as a right-in/right-out access with one ingress lane and one egress lane with an appropriate internal tangent throat distance.
2. Construct a northbound right-turn lane on NC 55 at Site Drive 2 with adequate storage and appropriate tapers.